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PHYSICAL ABUSE AROUND THE TIME OF PREGNANCY: AN EXAMINATION OF PREVALENCE AND RISK FACTORS IN 16 STATES¹

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Objectives: From self-reports we describe and compare the levels and patterns of physical abuse before and during pregnancy while also describing the demographic and pregnancy related characteristics of physically abused women, the stressful experiences of abused women prior to delivery, and the relationship of the abused woman to the perpetrator(s). **Methods:** We used population-based estimates from the Pregnancy Risk Assessment Monitoring System (1996–98) to calculate a multiyear 16-state prevalence with 95% confidence intervals (CIs) and unadjusted risk ratios for demographic, pregnancy-related, and stressful experiences variables. **Results:** We found the prevalence of abuse across the 16 states to be 7.2% (95% CI, 6.9–7.6) during the 12 months before pregnancy, 5.3% (95% CI, 5.0–5.6) during pregnancy, and 8.7% (95% CI, 8.3–9.1) around the time of pregnancy (abuse before or during pregnancy). The prevalence of physical abuse during pregnancy across the 16 states was consistently lower than that before pregnancy. For time periods both before and during pregnancy, higher prevalence was found for women who were young, not White, unmarried, had less than 12 years of education, received Medicaid benefits, or had unintended pregnancies, and for women with stressful experiences during pregnancy, particularly being involved in a fight or increased arguing with a husband or partner. For each of these risk groups, the prevalence was lower during pregnancy than before. Abuse was ongoing before pregnancy for three quarters of the women experiencing abuse by a husband or partner during pregnancy.

¹ Portions of this paper were presented at the National Conference on Violence and Reproductive Health: Science, Prevention, and Action, Atlanta, June 1999; the American Society of Criminology Meetings, Toronto, Canada, November 1999; the Maternal, Infant and Child Health Epidemiology Workshop, Atlanta, December 1999; and the Fifth World Conference on Injury Prevention and Control, New Delhi, India, March 2000.

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Conclusions: Women are not necessarily at greater risk of physical abuse when they are pregnant than before pregnancy. Both the preconception period and the period during pregnancy are periods of risk, which suggests that prevention activities are appropriate during routine health care visits before pregnancy as well as during family planning and prenatal care.

KEY WORDS: physical abuse; violence; partner abuse; pregnancy; PRAMS; reproductive health.

I. INTRODUCTION

Data from the National Violence Against Women Survey indicate that more than 2 million women, or 2.1% of women aged 18 years and older, are physically assaulted or forcibly raped annually in the United States.² More than 1.5 million of these women, or 1.5% of the population, are victimized by an intimate partner, that is, a current or former spouse, cohabiting partner, or date.³ According to the National Crime Victimization Survey (NCVS), for the years 1993–99 all population subgroups reported intimate partner violence.⁴ Black and White women experienced similar magnitudes of intimate partner violence in all age groups except 20–24, where Black women had significantly higher rates. Partner violence was reported most frequently by women who were young (aged 16–24), separated or divorced, or reporting lower annual household income. Women living in rental housing and urban areas reported partner violence more frequently according to an earlier NCVS report for the years 1993–98.⁵

Although a fair amount is known about the prevalence of partner violence overall, it has been more difficult to gain a good understanding of the characteristics of women who report violence around the time of pregnancy and the extent of the violence they experience. Published studies vary greatly with respect to sample

² PATRICIA TJADEN & NANCY THOENNES, U.S. DEP'T. OF JUSTICE, FULL REPORT OF THE PREVALENCE, INCIDENCE, AND CONSEQUENCES OF VIOLENCE AGAINST WOMEN: FINDINGS FROM THE NATIONAL VIOLENCE AGAINST WOMEN SURVEY, NCJ 183781 (Nov. 2000).

³ PATRICIA TJADEN & NANCY THOENNES, U.S. DEP'T. OF JUSTICE, EXTENT, NATURE, AND CONSEQUENCES OF INTIMATE PARTNER VIOLENCE: FINDINGS FROM THE NATIONAL VIOLENCE AGAINST WOMEN SURVEY, NCJ 181867 (July 2000).

⁴ C.M. RENNISON, U.S. DEP'T. OF JUSTICE, INTIMATE PARTNER VIOLENCE AND AGE OF VICTIM, NCJ 187635 (Oct. 2001).

⁵ C.M. RENNISON & S. WELCHANS, U.S. DEP'T. OF JUSTICE, EXTENT, INTIMATE PARTNER VIOLENCE, NCJ 178247 (May 2000).

composition and with respect to the characteristics assessed for each woman, and for the time periods being compared.^{6,7} Generalizability has been further limited for studies involving small, clinic-based samples or recipients of services provided by shelters for battered women. Observed differences in prevalence may reflect variations in study populations.⁸

The estimated prevalence of women experiencing violence during pregnancy ranges from 4 to 8% for the majority of studies.^{9,10} Applying that range to the 3.9 million women in the United States whose pregnancies resulted in live births during 1998 suggests that between 152,000 and 324,000 women each year experience violence while they are pregnant.¹¹ For women abused during pregnancy, some demographic information is also available. A state-based analysis found that in a majority of states examined, the prevalence of physical abuse by a husband or partner, during pregnancy was higher among women having less than 12 years of education and women who were Medicaid recipients.¹² The prevalence of physical abuse during pregnancy did not differ by race in most states, and no consistent pattern emerged from those few states in which differences based on race were reported. Multivariate analysis using a national probability sample found no direct effect of pregnancy on risk for violence victimization for Anglo or Hispanic families when socioeconomic status, stressful life events, and age were controlled.¹³

Prevalence estimates range from 4 to 26% for abuse during the year preceding pregnancy.¹⁴ From a statewide sample of North

⁶ J.A. Gazmararian, et al. *Prevalence of Violence Against Women*, 275 J. AM. MED. ASSOC. 1915-20 (1996).

⁷ J.A. Gazmararian, et al. *Violence and Reproductive Health: Current knowledge and future research directions*, 4 MATERN. CHILD HEALTH J. 79-84 (2000).

⁸ S.L. Martin, et al.. *Physical Abuse of Women Before, During, and After Pregnancy*. 285 J. AM. MED. ASSOC. 1581-84 (2001).

⁹ Gazmararian, *supra* note 6.

¹⁰ Gazmararian, *supra* note 7.

¹¹ *Id.*

¹² B.J. Colley Gilbert, et al. *Prevalence of Selected Maternal and Infant Characteristics, Pregnancy Risk Assessment Monitoring System (PRAMS), 1997*. 48(5) MORB. MORTAL. WKLY. REP. CDC SURVEILL. SUMM. 1-37 (1999).

¹³ J.L. Jasinski & G. Kaufman Kantor. *Pregnancy, Stress, and Wife Assault: Ethnic Differences in Prevalence, Severity, and Onset in a National Sample*, 16 VIOLENCE VICT. 219-32 (2001).

¹⁴ Martin, *supra* note 8.

Carolina women, the prevalence of abuse was found to be 6.9% before pregnancy compared to 6.1% during pregnancy.¹⁵

Perhaps as compelling as the need for reliable prevalence estimates for violence around the time of pregnancy is the need to address the dearth of evidence to support assertions that a woman's risk of experiencing physical abuse increases during pregnancy. Although statements are commonly made that the incidence of abuse escalates during pregnancy,¹⁶ these often rely upon anecdotal evidence or small studies with self-selected participants, and not on comparisons of pregnant women to women who are not pregnant.¹⁷ Little is actually known about whether women are at greater risk of abuse during pregnancy than at other times, and few studies indicate whether risk of abuse is likely to start, end, or continue during pregnancy. A notable exception is recent multivariate analysis using longitudinal data from the National Survey of Families and Households indicating that pregnant women are not any more or less likely to suffer intimate partner violence than women who are not pregnant.¹⁸

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a population-based surveillance system of self-reported maternal behaviors and experiences occurring before, during, and shortly after a woman's pregnancy.^{19,20} As such, PRAMS can address problems of generalizability and comparability with respect to standard time periods and standard questions asked across many states and population groups.²¹ The purpose of the present study was to use population-based estimates from PRAMS in the following four ways: 1) describe and compare the reported levels and patterns of physical abuse at three time periods: during the 12 months before pregnancy, during the most recent pregnancy, and around the time of pregnancy (before or during pregnancy or at both times); 2) describe the demographic and pregnancy-related characteristics of women reporting physical abuse;

¹⁵ *Id.*

¹⁶ S.C. Brundage. *Preconception Health Care*, 65 AM. FAM. PHYSICIAN 2507-14 (2002).

¹⁷ J.L. Jasinski. *Pregnancy and Violence Against Women: An Analysis of Longitudinal Data*, 16 J. INTERPERS VIOLENCE 712-33 (2001).

¹⁸ *Id.*

¹⁹ Colley Gilbert, *supra* note 12.

²⁰ B. Colley Gilbert, et al. *The Pregnancy Risk Assessment Monitoring System (PRAMS): Methods and 1996 Response Rates from 11 States*, 3 MATERN. CHILD HEALTH J 199-209 (1999).

²¹ T.J. Ballard, et al. *Violence During Pregnancy: Measurement Issues*, 88 AM. J. PUBLIC HEALTH 274-76 (1998).

3) describe certain stressful experiences prior to delivery reported by physically abused women; and 4) describe women who reported physical abuse by their relationship to the perpetrator(s).

II. METHODS

PRAMS data are collected in participating states by using a standardized data collection methodology developed by CDC.²² Every month in each state, a stratified sample of 100–250 new mothers is selected from a frame of eligible birth certificates. Each sampled mother is mailed an explanatory letter that introduces the survey, followed by a 14-page questionnaire at 2–6 months after delivery. A second questionnaire package, and in most states a third, is mailed to those who do not respond. Mothers are contacted by telephone if the mailed questionnaires are not returned. PRAMS uses a complex sampling design; women at higher risk of poor pregnancy outcomes are oversampled in most states. Information from the birth certificate is used to weight the collected data for sample stratification, nonresponse, and noncoverage. The complete PRAMS methodology has been described elsewhere.²³

Although PRAMS currently operates in 32 states and New York City, many of them were newly funded when this analysis began. Data were available from 1996 to 1998 for 64,994 women from 16 states (Alabama, Alaska, Arkansas, Colorado, Florida, Georgia, Illinois, Louisiana, Maine, Michigan, New York, North Carolina, Oklahoma, South Carolina, Washington, and West Virginia). Nine of the states had data for 3 years (1996–98 for AK, AL, FL, ME, NY, OK, SC, WA, and WV), five had data for 2 years (1996–97 for GA; 1997–98 for AR, CO, IL, and NC), and two had only 1 year of data (1998 for LA; 1996 for MI). The 1997 and 1998 data for Oklahoma include responses from women aged 18 and older. North Carolina data for 1997 represent births occurring from July through December. New York data are for upstate New York and exclude New York City. For each of the 16 states included in this analysis, the weighted response rates, adjusted for sample design, were 70% or higher.

The PRAMS questionnaire addresses a myriad of topics, including barriers to and content of prenatal care, obstetric history, maternal use of alcohol and cigarettes, nutrition, economic status,

²² CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC), PRAMS MODEL SURVEILLANCE PROTOCOL (1999).

²³ Colley Gilbert, *supra* note 20.

maternal stress, and early infant development and health status. The Phase 3 questionnaire, used throughout the 1996–98 study period, was the first to include a series of questions related to physical abuse occurring around the time of pregnancy. These questions measure the prevalence of physical abuse before and during pregnancy and identify the perpetrator–victim relationship for women who report abuse (Table I). *Physical abuse* is defined in the questionnaire as “pushing, hitting, slapping, kicking, or any other way of physically hurting someone.” Women reporting abuse can identify one or more perpetrators for each period of abuse. For open-ended responses indicating that the perpetrator was a former husband or partner, we recoded the relationship as husband/partner, assuring consistency with the CDC uniform definitions for intimate partner violence.²⁴ Some women reported abuse by a husband or partner as well as by another family member, friend, or someone else. When we analyzed the perpetrator–victim relationship, we included all women who reported each type of relationship. We also examined the group of women who reported more than one type of perpetrator.

In describing the prevalence of physical abuse, we refer to three time periods when abuse may have occurred: *before pregnancy*, measured as the 12 months before the respondent got pregnant; *during pregnancy*; and *around the time of pregnancy*, which includes women abused before or during pregnancy or at both times.

To describe women who reported physical abuse before, during, or around the time of pregnancy, we considered *demographic characteristics*: maternal age, race, ethnicity, marital status, education, and parity; *pregnancy-related characteristics*: Medicaid status, pregnancy intention, smoking during the last 3 months of pregnancy, alcohol use during the last 3 months of pregnancy, type of prenatal care provider, and infant birth weight; and *stressful experiences occurring during the 12 months before delivery*: involvement in a physical fight, increased arguing with husband or partner, drinking or drug problem of someone close, becoming separated or divorced, and homelessness. The demographic characteristics and infant birth weight were obtained from state birth certificate data linked to the PRAMS questionnaire. Other variables were taken directly from the PRAMS questionnaire.

²⁴ L.E. SALTZMAN, ET AL., CENTERS FOR DISEASE CONTROL AND PREVENTION & NATIONAL CENTER FOR INJURY PREVENTION AND CONTROL, INTIMATE PARTNER VIOLENCE SURVEILLANCE: UNIFORM DEFINITIONS AND RECOMMENDED DATA ELEMENTS, VERSION 1.0 (1999).

A *Medicaid recipient* was defined as a woman who reported that she received Medicaid just before she became pregnant, or that Medicaid paid for her prenatal care or the delivery. *Type of prenatal care provider* was classified as public if a woman reported her prenatal care provider was at a hospital, health department, military facility, community or rural health clinic, an Indian Health Service clinic, or an Alaskan Native clinic; all other sources were referred to as private and included physician or midwife, health maintenance organization, and birthing center. *Pregnancy intention* was categorized as intended if the woman wanted the pregnancy “then” or “sooner” or unintended if the woman wanted the pregnancy “later” or “not at all.” Responses to any question coded as “missing” or “don’t know” were excluded from analyses.

We aggregated the data across all states and years and calculated a multiyear 16-state prevalence with a 95% confidence interval for each characteristic. The prevalence figures we present are representative of the populations of these states for these years. For each 16-state prevalence, significant differences between factor levels were determined by nonoverlapping 95% confidence intervals. We confirmed that these differences were significant by performing chi-square tests. With the aggregated data we also calculated relative risks to assess the strength of the association between physical abuse and each of the demographic, pregnancy-related, and stressful experience variables. In this paper we present our initial descriptive analysis, focusing on prevalence at different time periods, and we begin the investigation of patterns of abuse and characteristics of abused women.

We also calculated the prevalence and 95% confidence intervals for physical abuse by the perpetrator–victim relationship for each time period. Using the three time periods as suggested by Ballard *et al.*,²⁵ we classified women experiencing abuse by a current or former husband or partner as having one of three *abuse patterns*: 1) *abuse starts*: abuse begins during pregnancy; 2) *abuse ceases*: abuse occurs before pregnancy but not during pregnancy; 3) *abuse continues*: abuse occurs before and during pregnancy. For the subgroup of women abused during pregnancy by a current or former husband or partner (patterns 1 and 3), we compared the proportion for whom abuse started during pregnancy and the proportion for whom abuse continued from before pregnancy. For women who reported abuse before and during pregnancy by a current or former husband or partner (pattern 3), we

²⁵ Ballard, *supra* note 21.

examined changes in the frequency of physical abuse across both time periods.

The prevalence of and risk ratios associated with physical abuse were calculated using SUDAAN software.²⁶

III. RESULTS

Our sample included 64,994 respondents, each of whom had delivered a live birth between 1996 and 1998. Approximately half (44.0%) of the women were 20–29 years of age, most (79.9%) had completed high school, two thirds (67.5%) were married, and less than half (42.2%) reported first births. Approximately three quarters (76.6%) were White, one fifth (19.4%) were Black, and the remaining 4% were of other race (mostly Native American and Asian/Pacific Islander). Almost one in nine (10.8%) was of Hispanic origin. Less than half (41.5%) received Medicaid benefits at some point around the time of pregnancy, while 43.8% of births were unintended at the time of pregnancy (either mistimed or unwanted) (data not shown). Weighted results form the basis of our findings and represent 2,776,328 births to residents in the 16 states in our study.

Among women in the 16 states who delivered a live-born infant, 7.2% (95% CI, 6.9–7.6) were physically abused during the 12 months before their most recent pregnancy (Table II). The prevalence of physical abuse during pregnancy was 5.3% (95% CI, 5.0–5.6). In all states, the prevalence of physical abuse during pregnancy was lower than the prevalence of physical abuse before pregnancy. When we took both time periods into consideration, the prevalence of physical abuse around the time of pregnancy—that is, either during the pregnancy or the 12 months preceding it or both—was 8.7% (95% CI, 8.3–9.1).

A. Physical Abuse in the 12 Months Before Pregnancy

The prevalence of physical abuse before pregnancy varied significantly by all demographic characteristics except parity and was highest in women who were less than 20 years old, Black, unmarried, or had less than 12 years of education (Table III). The prevalence of abuse before pregnancy varied significantly for all pregnancy-related characteristics except alcohol use during the last 3 months of pregnancy and was consistently higher when women received Medicaid benefits, delivered a low birth weight infant, had not intended to become pregnant, smoked

²⁶ B.V. SHAH, ET AL., RESEARCH TRIANGLE INSTITUTE, SUDAAN USER'S MANUAL: SOFTWARE FOR ANALYSIS WITH CORRELATED DATA, RELEASE 7.5.3 (1998).

cigarettes during the last 3 months of pregnancy, or received prenatal care from a publicly funded provider. The prevalence of physical abuse before pregnancy also varied significantly by all stressful experiences and was higher when women were involved in a fight, had experienced increased arguing with their husband or partner, had a close friend with a drinking or drug problem, had recently separated or divorced, or had been homeless.

The 16-state risk ratios indicate that younger women, unmarried women, those with less education, and those who received Medicaid were at considerably higher risk of experiencing abuse before pregnancy. Women less than 20 years of age were 3.9 times as likely to be abused before pregnancy as were women aged 30 and older. Women with less than 12 years of education were 4.4 times as likely to experience abuse before pregnancy as women with more than 12 years of education. The highest risk ratios, however, were associated with stressful experiences. Women who were involved in a fight during the 12 months before pregnancy were 15.9 times as likely to be abused before pregnancy as women who were not involved in a fight. Elevated increases in risk of abuse were also associated with increased arguing with a husband or partner (RR D 5:2), having someone close with a drinking or drug problem (RR D 4:9), becoming separated or divorced during the 12 months before pregnancy (RR D 5:1), and having been homeless (RR D 3:8) (Table III).

B. Physical Abuse During Pregnancy

The prevalence of physical abuse during pregnancy was lower than that before pregnancy for all characteristics and subpopulations examined (Table IV). We found no group for which this relationship was reversed. Yet, the high-risk groups and risk ratios were quite similar for women abused either during or before pregnancy. The prevalence of physical abuse during pregnancy varied significantly for all demographic characteristics except parity, all pregnancy-related characteristics, and all stressful experiences, and was higher when women had the same characteristics and stressful experiences as for abuse before pregnancy.

The risk ratios indicate that the women with higher risk of abuse during pregnancy had the same characteristics and experiences as the women with higher risk of abuse before pregnancy. Women less than 20 years of age were 4.3 times as likely to experience abuse during pregnancy as women aged 30 and older, and women with less than 12 years of education were 4.7 times as likely to experience abuse during

pregnancy as women with more than 12 years of education. Substantial increases in risk of abuse were associated with stressful experiences, including being involved in a fight during pregnancy (RR D 24.1), increased arguing with a husband or partner (RR D 6:3), having someone close with a drinking or drug problem (RR D 4:7), becoming separated or divorced during pregnancy (RR D 5:3), and having been homeless (RR D 4:5) (Table IV).

C. Physical Abuse Around the Time of Pregnancy

When we considered the full period of time around pregnancy (that is, either before the pregnancy, during it, or at both time periods), we found similar results for the characteristics under study (data not shown). The prevalence of physical abuse around the time of pregnancy varied significantly by all demographic and pregnancy-related characteristics except parity and alcohol use, and by all stressful experiences. Risk ratios were of a similar magnitude to those for the two discrete time periods.

D. Physical Abuse and Relationship to Perpetrator

A husband or partner was by far the most common perpetrator of abuse, accounting for 75% (6.5%/8.7%) of all women abused around the time of pregnancy (Table V). Because of small sample sizes, we collapsed abuse by a family member, friend, or someone else into a single perpetrator group for comparison purposes. Across the 16 states, 5.4% of women reported being physically abused by their husband or partner in the 12 months before their most recent pregnancy. Abuse by a husband or partner was less prevalent during pregnancy than before (4.1%), and 6.5% experienced abuse by their husband or partner around the time of the most recent pregnancy.

The prevalence of abuse by a family member, friend, or other perpetrator was significantly lower than that for abuse by husband or partner. For the 12 months before pregnancy, 2.3% of women experienced abuse by a family member, friend, or other perpetrator; for abuse during pregnancy the prevalence was 1.6%; and for abuse around the time of pregnancy the prevalence was 3.0%. For each time period, the 16-state prevalence of abuse by a family member, friend, or other perpetrator was less than half the prevalence for women physically abused by their husband or partner.

E. Patterns of Physical Abuse

To examine patterns of physical abuse, we focused on abuse by husbands or partners, as the percentage of women abused by perpetrators other than husbands or partners was low. Across the 16 states, the 6.5% of women who were abused by a husband or partner around the time of pregnancy represent 180,222 women with a recent live birth who experienced abuse. We compared the percentage of women whose abuse started before and continued during pregnancy with the percentage of women whose abuse (a) started during pregnancy or (b) ceased during pregnancy (data not shown). Across the 16 states, the predominant pattern was abuse that continued from before pregnancy to during pregnancy (3.0%) with abuse that ceased during pregnancy slightly less prevalent (2.4%) and abuse that started during pregnancy the least common pattern (1.1%).

We further examined (Fig. 1) the subset of women (4.1%) who experienced abuse by a husband or partner during pregnancy (3.0% both before and during pregnancy; 1.1%, started during pregnancy). That subset represents 112,749 women in the 16 states who were abused during pregnancy. Abuse during pregnancy continued preexisting abuse in 73% of cases (3.0%/4.1%), whereas for the remaining 27% of women the abuse started during pregnancy.

For the 3.0% of women for whom "abuse continued" we analyzed responses to the question on the change in frequency of abuse (data not shown). Across the states, for 48.5% of this group the abuse occurred less often during pregnancy than before; for 30.8%, the abuse occurred with about the same frequency; and for 20.8%, abuse occurred more often during pregnancy than before. The three estimates were significantly different.

IV. DISCUSSION

Our study establishes the magnitude of the problem of physical abuse around the time of pregnancy for the population of new mothers in 16 states. We found the prevalence of abuse across 16 states to be 7.2% before pregnancy, 5.3% during pregnancy, and 8.7% around the time of pregnancy (before or during pregnancy or at both times). Our findings for the prevalence of violence during pregnancy are in keeping with earlier estimates of 4–8%.²⁷ Data demonstrating that physical abuse occurs more often before than during pregnancy is consistent with prior findings for a single state.²⁸ Prevalence of abuse was also lower during

²⁷ Gazmararian, *supra* note 6.

²⁸ Martin, *supra* note 8.

pregnancy for women in the highest-risk groups when we examined a variety of demographic and pregnancy-related characteristics, and stressful experiences. Moreover, for women experiencing partner abuse both before and during pregnancy, the abuse was generally less frequent during pregnancy. Our results challenge anecdotal evidence that a woman's risk of experiencing physical abuse increases during pregnancy.

Women at highest risk of abuse across all three time periods were young, unmarried, had less than 12 years of education, experienced unintended pregnancies, received Medicaid benefits, or suffered stressful experiences during pregnancy, particularly involvement in a fight or increased arguing with a husband or partner. This research supports and extends other state-based analyses of violence during pregnancy,^{29,30,31} while also providing information about physical abuse in the year before pregnancy.

Our findings about risk groups for women whose recent pregnancies resulted in live births are consistent with NCVS data³² demonstrating that intimate partner abuse is more likely to occur in women—regardless of pregnancy status—who are young, separated, or divorced, or who have low incomes. The risk factors for physical abuse around the time of pregnancy may not be unique for pregnancy status but rather may be important factors to focus on when dealing with physical abuse over the entire life span of a woman, including prior to and during pregnancy.

For women in our study who were abused during pregnancy by an intimate partner, we found that for about three quarters, the abuse had begun before pregnancy. Thus abuse during pregnancy may be linked to factors other than pregnancy status.

This study employed numerous approaches to address gaps in data and methodology in the physical abuse literature, with the goal of producing a thorough, comprehensive assessment of the extent of physical abuse experienced by women around the time of pregnancy. Previously, the ability to compare prevalence at different time periods has been limited because periods of exposure around the time of pregnancy have not been consistently defined or measured.^{33,34}

²⁹ *Id.*

³⁰ Colley Gilbert, *supra* note 12.

³¹ S.L. Martin SL, et al. *Stressful Life Events and Physical Abuse Among Pregnant Women in North Carolina*, 5 *MATERN. CHILD HEALTH J* 145-52 (2001).

³² RENNISON, *supra* note 4.

³³ Ballard, *supra* note 21.

Following Ballard *et al.*,³⁵ our analysis used clearly defined time periods, enabling us to compare abuse prevalence in each time period and to examine patterns and changes in frequency across time periods. Combining data for multiple years increased our sample size of respondents beyond those of previous studies with shorter time frames^{36,37}, or a focus on a single state.³⁸ Use of 16-state population-based data enabled us to calculate population prevalences. Our findings represent nearly 3 million women, approximately one third of all new mothers in the United States during 1996–98, and they can be helpful in generating testable hypotheses for other states and for the United States as a whole.

The study has several limitations. To maximize our ability to examine characteristics in many states, we included data from every state available in PRAMS, even those with fewer than 3 years of data. We acknowledge the potential for increased variability in state prevalences that is introduced by having a different number of years of data (from one to three) contributed by each of the 16 states. In addition, despite our large total sample size, the relative rarity of physical abuse limited our ability to fully examine every characteristic of interest (e.g., perpetrator–victim relationship, alcohol use, and change in abuse frequency across time periods). Moreover, even though the 16 states in our study provided valuable data, they do not represent the entire United States; thus, we cannot provide a national estimate for physical abuse.

Women in PRAMS may have underreported their violence experiences, creating an underestimate of physical abuse. Surveys including questions on sensitive topics have been shown to have lower disclosure rates for the specific sensitive items.³⁹ Our estimates of the prevalence of husband or partner abuse are also likely to be

³⁴ R. PETERSEN, ET AL., NATIONAL CENTER FOR CHRONIC DISEASE PREVENTION AND HEALTH PROMOTION, NATIONAL CENTER FOR INJURY PREVENTION AND CONTROL, & CENTERS FOR DISEASE CONTROL AND PREVENTION, KEY SCIENTIFIC ISSUES FOR RESEARCH ON VIOLENCE OCCURRING AROUND THE TIME OF PREGNANCY (1998).

³⁵ Ballard, *supra* note 21.

³⁶ Martin, *supra* note 8.

³⁷ Colley Gilbert, *supra* note 12.

³⁸ Martin, *supra* note 8.

³⁹ J. GFROERER, ET AL., *Studies Of Nonresponse And Measurement Error In The National Household Survey On Drug Abuse*. Found in NIDA RES MONOGRAPH #167: THE VALIDITY OF SELF-REPORTED DRUG USE: IMPROVING THE ACCURACY OF SURVEY ESTIMATES, 1997, available at <http://165.112.78.61/pdf/monographs/monograph167/download167.html> (last accessed Nov. 2002).

underestimates, because abuse by ex-husbands and former partners was not an explicit response category. Responses to the open-ended category that were clearly identified as former partners were recoded as husband or partner, but it is likely that some women did not report abuse by former partners because it would have required a written response. Other women may have provided insufficient information about the relationship to the perpetrator for us to recode it. Our study is also subject to the limitations of self-report studies, such as recall bias.

Because of the self-report format, we also cannot discount the possibility that respondents interpreted terminology on the survey in different ways. For example, although the survey defines physical abuse, it does not define “fighting,” a term used for one of the stressful experience variables. The largest risk ratios we observed were, first, for women who reported being involved in a fight, followed by women arguing more often with their husband or partner. We can hypothesize that the fighting question, and perhaps the question about increased arguing, may in part measure the same events as the physical abuse items, because an argument might precede or accompany abuse, and abuse may involve physical fighting. Hence, results may be confounded. As currently stated, neither the physical abuse questions nor the question about fighting enables us to define the respondents’ roles in the abuse or the fights, or whether the same events are being measured. This is an intriguing area for additional research.

Caution must be used in interpreting and generalizing our findings. We cannot draw conclusions about women whose pregnancy did not end in a live birth (e.g., abortion, miscarriage), women whose babies were adopted, or women whose abuse was so severe that it ended in their death. Because we address only physical abuse, we also cannot draw conclusions about emotional or sexual abuse, although we know that those types of abuse also have serious health consequences for women and that they often occur in conjunction with physical abuse.^{40,41,42} We are unable to determine, for example, whether the lower physical abuse prevalence observed during pregnancy among all women delivering live births, or the decrease in abuse frequency during

⁴⁰ J.C. Campbell & L.A. Lewandowski. *Mental and physical health effects of intimate partner violence*, 20 PSYCHIATR. CLIN. NORTH AM. 353-74 (1997).

⁴¹ A.L. Coker, et al. *Physical health consequences of physical and psychological intimate partner violence*, 9 ARCH. FAM. MED. 451-57 (2000).

⁴² M.A. Kernic, et al. *Rates and relative risk of hospital admission among women in violent intimate partner relationships*, 90 AM. J. PUBLIC. HEALTH. 1416-20 (2000).

pregnancy among women abused by partners both before and during pregnancy, reflects a shift from physical to emotional abuse.

An additional limitation of the PRAMS data is that the periods of exposure to physical violence are not equal (12 months before pregnancy, during pregnancy, and around the time of pregnancy). Despite this limitation, having the three time periods available allows us to explore and compare the risk of abuse during pregnancy to risk at other defined time periods. These data also provide prevalence estimates for the various time periods that can be used by others to examine physical abuse at other nonpregnant periods besides the year preceding pregnancy. Future studies should address the comparison of equivalent time periods, either through adjustment techniques or through study questions that address equal time periods.

While this study begins to enhance our understanding of the relationship between physical abuse and a variety of variables, future multivariable modeling can adjust for confounders and identify key risk factors predictive of physical abuse. Future research should also examine postpartum abuse. A prospective study of adolescent girls seen in the postpartum unit of a teaching hospital found the highest levels of abuse at 3 months postpartum (21%). Many of the adolescent mothers had not reported partner violence prior to delivery.⁴³ A statewide sample of North Carolina women found the prevalence of abuse during the postpartum period (mean of 3.6 months after delivery) to be 3.2%, versus 6.9% before pregnancy and 6.1% during pregnancy.⁴⁴ Additional population-based information on postpartum abuse will expand our ability to describe how abuse varies across different time periods around pregnancy. Our study defined abuse around the time of pregnancy to include the periods before and during pregnancy, but a more complete operational definition, following Petersen *et al.*,⁴⁵ would incorporate postpartum abuse and additional types of abuse. This may soon be possible as beginning in 2002, optional standard questions about emotional, sexual, and postpartum abuse became available to PRAMS participants.

This study's findings from population-based state PRAMS data have important implications for practitioners. Our findings confirm that the preconception period is one of risk, and that much of the

⁴³ S.D. Harrykissoon, et al. *Prevalence and patterns of intimate partner violence among adolescent mothers during the postpartum period*, 156 ARCH. PEDIATR. ADOLESC. MED. 325-30 (2002).

⁴⁴ Martin, *supra* note 8.

⁴⁵ PETERSEN, *supra* note 34.

intimate partner abuse occurring during pregnancy is a continuation of preexisting abuse. Recognition of the preconception period as a time when women are at risk of abuse suggests that prevention information should be targeted at *all* women at various points in the health care system, for example, during routine gynecologic and other office or clinic visits as well as during family planning. In addition, our data can help practitioners target high-risk groups. For example, evidence from this study and others^{46,47,48} suggests that women with unintended pregnancies are at increased risk of physical abuse around the time of pregnancy, and this lends further support to the importance of discussing abuse during family planning and other health care visits in the preconception period. Although our findings suggest that the great majority of women experience no physical abuse around the time of pregnancy and (contrary to assumptions based on anecdotal evidence) pregnant women are not necessarily at *greater* risk of physical abuse than they were before conception, they confirm that women continue to be at risk when pregnant. Multiple visits, which are usual during prenatal care, provide the opportunity for women to build trust in their practitioners and may enable discussion of and education about abuse,^{49,50} while also providing an opportunity for more in-depth counseling and intervention for those who disclose abuse.

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⁴⁶ Jasinski, *supra* note 13.

⁴⁷ J.A. Gazmararian et al. *The relationship between pregnancy intendedness and physical violence in mothers of newborns*, 85 OBSTET. GYNECOL. 1031-38 (1995).

⁴⁸ M.M. Goodwin, et al. *Pregnancy intendedness and physical abuse around the time of pregnancy: Findings from the Pregnancy Risk Assessment Monitoring System, 1996–1997*, 4 MATERN. CHILD HEALTH J 85-92 (2000).

⁴⁹ Brundage, *supra* note 16.

⁵⁰ T. Durant, et al. *Opportunities for intervention: Discussing physical abuse during prenatal care visits*, 19 AM. J. PREV. MED. 238-44 (2000).

PhD; New Jersey – Lakota Kruse, MD; New Mexico – Ssu Weng, MD, MPH; New York State – Anne Radigan-Garcia; New York City – Fabienne Laraque, MD; North Carolina – Paul Buescher, PhD; North Dakota – Sandra Anseth, RN; Ohio – Adriana Pust; Oklahoma – Dick Lorenz, MS; Oregon – Ken Rosenberg, MD, MPH; Rhode Island – Sam Viner-Brown; South Carolina – Mary Kate Dillard; Texas – Kamila Bajwa-Mistry; Utah – Lois Bloebaum; Vermont – Peggy Brozicevic; Washington – Linda Lohdefinck; West Virginia – Melissa Baker, MA; CDC PRAMS Team, Applied Sciences Branch, Division of Reproductive Health.

Table I. Pregnancy Risk Assessment Monitoring System (PRAMS): Physical Abuse Questions (Phase 3)

The next questions are about physical abuse. *Physical abuse means pushing, hitting, slapping, kicking, or any other way of physically hurting someone.*

During the 12 months before you got pregnant with your new baby, did any of these people physically abuse you? Check all that apply.

- My husband or partner
 A family or household member *other than* my husband or partner
 A friend
 Someone else —> Please tell us: _____
 No one physically abused me during the 12 months before I got pregnant

During your most recent pregnancy, did any of these people physically abuse you? Check all that apply.

- My husband or partner
 A family or household member *other than* my husband or partner
 A friend
 Someone else —> Please tell us: _____
 No one physically abused me during my pregnancy —> Skip next question

During your most recent pregnancy, would you say that you were physically abused *more often*, *less often*, or *about the same* compared to the 12 months before you got pregnant? Check only one.

- I was physically abused *more often* during my pregnancy
 I was physically abused *less often* during my pregnancy
 I was physically abused *about the same* during my pregnancy
 No one physically abused me during the 12 months before I got pregnant.

Table II. Prevalence of Physical Abuse Around the Time of Pregnancy, Pregnancy Risk Assessment Monitoring

System, 16 States, 1996–98

	Before ^a		During		Around ^b	
	Prevalence (%)	95% Confidence interval	Prevalence (%)	95% Confidence interval	Prevalence (%)	95% Confidence interval
AL	7.2	6.3–8.1	5.7	4.9–6.4	8.7	7.8–9.7
AK	8.4	7.4–9.3	5.8	5.0–6.6	9.8	8.8–10.8
AR	9.6	8.2–11.0	6.4	5.2–7.6	10.7	9.2–12.2
CO	6.0	4.9–7.1	3.9	3.0–4.7	6.7	5.5–7.9
FL	8.0	7.0–8.9	6.1	5.3–6.9	9.8	8.7–10.8
GA	7.3	5.9–8.7	5.2	4.1–6.3	8.4	6.9–9.9
IL	6.2	5.1–7.2	4.9	4.0–5.8	7.6	6.5–8.8
LA	8.7	7.3–10.1	6.5	5.3–7.7	10.6	9.0–12.1
ME	5.6	4.7–6.5	3.8	3.0–4.5	6.5	5.6–7.4
MI	7.5	5.4–9.5	5.6	3.8–7.5	8.8	6.6–11.1
NC	7.5	6.1–8.9	6.3	5.1–7.6	9.5	7.9–11.0
NY	5.7	4.6–6.7	4.1	3.2–5.0	7.0	5.8–8.2
OK	9.5	8.2–10.7	6.8	5.7–7.9	11.0	9.7–12.4
SC	8.1	6.9–9.3	5.6	4.6–6.6	9.9	8.5–11.2
WA	6.0	5.1–6.9	4.1	3.4–4.9	7.3	6.3–8.3
WV	8.7	7.6–9.7	5.8	4.9–6.7	10.0	8.9–11.2
16-state Prevalence ^c	7.2	6.9–7.6	5.3	5.0–5.6	8.7	8.3–9.1

^aDuring the 12 months before pregnancy.

^bDuring pregnancy or the 12 months before it or at both times.

^cPrevalence for these 16 states, based on aggregated data across all states and all years

Table III. Prevalence of and Risk Ratios for Physical Abuse Before Most Recent Pregnancy,* by Demographic and Pregnancy-Related Characteristics and Stressful Experiences, Pregnancy Risk Assessment Monitoring System, 16 States, 1996-98

	16-state prevalence ^b and risk ratios			
	Prevalence (%)	95% Confidence interval	RR	95% Confidence interval
Overall	7.2	6.9-7.6		
<i>Demographic characteristics</i>				
<i>Age, years</i>				
<20	14.1	12.9-15.2	3.9	3.4-4.6
20-29	7.9	7.4-8.4	2.2	1.9-2.5
≥30	3.6	3.1-4.0	1.0	—
<i>Race</i>				
White	6.2	5.8-6.5	1.0	—
Black	11.0	10.2-11.8	1.8	1.6-2.0
Other ^c	8.9	7.2-10.7	1.5	1.2-1.8
<i>Ethnicity</i>				
Non-Hispanic	7.1	6.7-7.4	1.0	—
Hispanic	8.5	7.3-9.8	1.2	1.0 ^d -1.4
<i>Marital status</i>				
Married	4.0	3.7-4.4	1.0	—
Other	13.6	12.8-14.4	3.4	3.1-3.7
<i>Education, years</i>				
0-11	15.0	13.9-16.1	4.4	3.9-5.0
12	8.0	7.3-8.6	2.4	2.1-2.7
>12	3.4	3.0-3.7	1.0	—
<i>Parity</i>				
1st birth	7.0	6.5-7.5	1.0	—
2nd or higher	7.3	6.9-7.8	1.0	0.9-1.2
<i>Pregnancy-related characteristics</i>				
<i>Medicaid recipient</i>				
No	3.2	2.9-3.5	1.0	—
At any time	12.9	12.2-13.6	4.0	3.6-4.5
<i>Birth weight (g)</i>				
<2500	9.6	9.0-10.2	1.4	1.3-1.5
≥2500	7.0	6.7-7.4	1.0	—
<i>Pregnancy intention</i>				
Intended	4.5	4.1-4.8	1.0	—
Unintended	10.5	9.9-11.2	2.4	2.1-2.6
<i>Cigarette use last 3 months</i>				
No	5.9	5.5-6.2	1.0	—
Yes	14.3	13.1-15.6	2.4	2.2-2.7
<i>Alcohol use last 3 months</i>				
No	7.2	6.8-7.5	1.0	—
Yes	8.0	6.4-9.6	1.1	0.9-1.4
<i>Prenatal care provider</i>				
Public	11.0	10.1-11.8	2.0	1.8-2.3
Private	5.4	5.0-5.8	1.0	—
<i>Stressful experiences</i>				
<i>Involved in fight</i>				
No	3.8	3.5-4.1	1.0	—
Yes	60.3	57.8-62.9	15.9	14.7-17.3
<i>Increased arguing</i>				
No	3.2	2.9-3.5	1.0	—
Yes	16.5	15.6-17.4	5.2	4.7-5.8
<i>Someone close had a drinking problem</i>				
No	4.6	4.3-4.8	1.0	—
Yes	22.1	20.6-23.6	4.9	4.4-5.3
<i>Recent separation/divorce</i>				
No	4.9	4.6-5.2	1.0	—
Yes	24.9	23.2-26.5	5.1	4.7-5.6
<i>Homeless</i>				
No	6.6	6.2-6.9	1.0	—
Yes	25.3	22.1-28.6	3.8	3.4-4.4

*During the 12 months before pregnancy.

^bPrevalence for these 16 states based on aggregated data across all states and all years.

^cOther race includes Alaska Native, Asian or Pacific Islander, and Native American.

^dValue of lower bound of confidence interval is 1.03 but rounds to 1.0; thus, the confidence interval does not overlap 1.0.

Table IV. Prevalence of and Risk Ratios for Physical Abuse *During* Most Recent Pregnancy, by Demographic and Pregnancy-Related Characteristics and Stressful Experiences, Pregnancy Risk Assessment Monitoring System, 16 States, 1996-98

	16-state prevalence* and risk ratios			
	Prevalence (%)	95% Confidence interval	RR	95% Confidence interval
Overall	5.3	5.0-5.6		
<i>Demographic characteristics</i>				
<i>Age, years</i>				
<20	11.0	9.9-12.0	4.3	3.6-5.1
20-29	5.8	5.3-6.2	2.3	1.9-2.6
>30	2.6	2.2-2.9	1.0	—
<i>Race</i>				
White	4.3	4.0-4.7	1.0	—
Black	9.1	8.4-9.8	2.1	1.9-2.3
Other ^b	6.1	4.6-7.5	1.4	1.1-1.8
<i>Ethnicity</i>				
Non-Hispanic	5.2	4.9-5.5	1.0	—
Hispanic	6.8	5.7-7.9	1.3	1.1-1.6
<i>Marital status</i>				
Married	2.8	2.5-3.0	1.0	—
Other	10.6	9.8-11.3	3.8	3.4-4.3
<i>Education, years</i>				
0-11	11.2	10.2-12.1	4.7	4.1-5.5
12	5.9	5.4-6.5	2.5	2.2-2.9
>12	2.4	2.1-2.6	1.0	—
<i>Parity</i>				
1st birth	5.1	4.7-5.5	1.0	—
2nd or higher	5.5	5.1-5.9	1.1	1.0-1.2
<i>Pregnancy-related characteristics</i>				
<i>Medicaid recipient</i>				
No	2.3	2.0-2.5	1.0	—
At any time	9.7	9.1-10.3	4.2	3.7-4.8
<i>Birth weight (g)</i>				
<2500	7.1	6.6-7.5	1.4	1.2-1.5
>2500	5.2	4.9-5.5	1.0	—
<i>Pregnancy intention</i>				
Intended	3.1	2.8-3.4	1.0	—
Unintended	8.0	7.4-8.6	2.6	2.3-2.9
<i>Cigarette use last 3 months</i>				
No	4.3	4.0-4.6	1.0	—
Yes	10.8	9.7-11.9	2.5	2.2-2.8
<i>Alcohol use last 3 months</i>				
No	5.3	4.9-5.6	1.0	—
Yes	7.3	5.7-8.9	1.4	1.1-1.8
<i>Prenatal care</i>				
Public	8.4	7.7-9.1	2.1	1.9-2.4
Private	4.0	3.6-4.3	1.0	—
<i>Stressful experiences</i>				
<i>Involved in fight</i>				
No		2.0-2.4	1.0	—
Yes	53.8	51.1-56.4	24.1	21.7-26.8
<i>Increased arguing</i>				
No	2.1	1.8-2.3	1.0	—
Yes	12.9	12.1-13.7	6.3	5.6-7.2
<i>Someone close had a drinking problem</i>				
No	3.4	3.1-3.7	1.0	—
Yes	16.1	14.8-17.4	4.7	4.2-5.3
<i>Recent separation/divorce</i>				
No	3.6	3.3-3.8	1.0	—
Yes	18.8	17.3-20.3	5.3	4.7-5.9
<i>Homeless</i>				
No	4.7	4.5-5.0	1.0	—
Yes	21.5	18.3-24.7	4.5	3.9-5.3

*Prevalence for these 16 states based on aggregated data across all states and all years

^bOther race includes Alaska Native, Asian or Pacific Islander, and Native American.

Table V. Prevalence of Physical Abuse Around the Time of Pregnancy, by Perpetrator-Victim Relationship, Pregnancy Risk Assessment Monitoring System, 16 States, 1996-98

	16-state prevalence ^a	
	Prevalence (%)	95% Confidence interval
Abuse <i>before</i> pregnancy	7.2	6.9-7.6
by husband/partner	5.4	5.1-5.7
by family/friend/other	2.3	2.1-2.5
by more than one perpetrator ^b	1.0	0.9-1.1
Abuse <i>during</i> pregnancy	5.3	5.0-5.6
by husband/partner	4.1	3.8-4.3
by family/friend/other	1.6	1.4-1.7
by more than one perpetrator	0.5	0.4-0.6
Abuse <i>around the time</i> of pregnancy	8.7	8.3-9.1
by husband/partner	6.5	6.2-6.9
by family/friend/other	3.0	2.7-3.2
by more than one perpetrator	1.2	1.1-1.4

^aAverage prevalence for these 16 states, based on aggregated data across all states and all years.

^bWomen who experienced abuse by more than one perpetrator were also included in either the "husband/partner" or "family/friend/other" category, as appropriate. Thus, this category is not mutually exclusive from the other two.

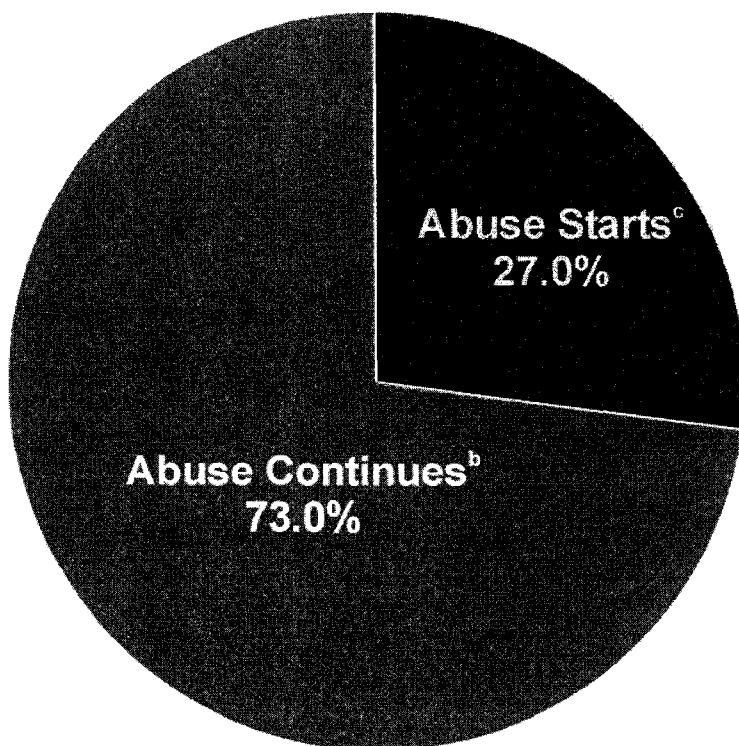


Fig. 1. Pattern of physical abuse among women abused by a husband or partner during pregnancy Pregnancy Risk Assessment Monitoring System, 16 States, 1996-98* (*4.1% of all women suffered abuse by a husband or partner during pregnancy; ^b3.0% of all women suffered abuse by a husband or partner that began before pregnancy and continued during pregnancy; ^c1.1% of all women suffered abuse by a husband or partner that started during pregnancy).